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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,081	12/19/2001	Dan-Xia Xu	12318-US	8729

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EXAMINER

MULPURI, SAVITRI

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 02/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/021,081	XU ET AL.	
	Examiner	Art Unit	
	Savitri Mulpuri	2812	AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 1-5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mantl.

Mantl discloses a method of making several devices including photodetector and waveguides by the following process steps: Providing a SOI substrate; forming a cobalt silicide layer on the silicon layer of SOI structure (see fig. 1b i.e bottom figure with SOI structure); patterning the silicide layer. Forming Si mesa structures (I,II,III) surrounded by silicide (see fig 1b and fig. 9). Mantl discloses forming silicon islands surrounded by silicide becomes waveguide, wherein the refractive index jump at the boundary between silicide and silicon enable the transmission and light in the waveguide, which is similar to forming silicide surrounding the silicon mirror in the instant invention. Mantl discloses forming Si/SiGe superlattices as an alternative to the just silicon layer alone for making a device (see fig.8 and col.9, lines 35-57). Mantl discloses forming photo detectors and waveguides (see col.5, lines 10-17).

Mantl discloses forming patterned silicide and heat-treating step in a single step, which is oxidation step. Oxidation step involves simultaneous heat treating along with patterning of silicide differs from the claimed steps of b and c steps of etching and heat-

treating. However, mantl also discloses forming patterning and etching silicide layers(see fig. 5 a- 5 c) to form silicon islands surrounding with silicide fro FETs. It would have been obvious to one of ordinary skill in the art to form silicon islands through patterning and etching of silicide because it would be art recognized equivalent process for waveguides.

Response to Amendment

Applicant argues that Mantl reference does not teach newly added claimed limitation of that silicide regions form opposite sidewalls of the waveguide photodetector and further they act as mirrors and electrodes for the photodetector. However, using silicide as mirrors and electrode is thought by Mantl. (Refer the rejection). Applicant argues that Mantl is intended to produce a layered structure for producing varied silicide regions in different vertical planes. However, such argument is not relevant to the claimed limitations. Applicant argues that there is no teaching in the mantl that would instruct one to build a waveguide photodetector in which the silicide regions from opposite sidewalls of the waveguide and in which silicide region act as mirror and electrode for photodetector. However, Mantl teaches silicide bounded silicon waveguides and photodiodes and the jump in refractive index at the boundary surface enable the transmission and light in the waveguide (see col. 9,lines 20-27 and 1b and col. 5, lines 13-17).

Applicant argues that Mantl reference describes a technique fro forming silicide structure in silicon using a specific local oxidation to cause the silicide to penetrate into silicon. However, Mantl forming silicide directly on silicon surface along with buried

silicide formed through local oxidation. Conclusively, mantl also discloses partially forming silicide termed as "bond" on the sidewalls of the waveguide devices (I, II) and claims, from the way they are recited, are readable on Mantl reference (se fig. 1).

Applicant's arguments with respect to claims 6-17 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Savitri Mulpuri whose telephone number is 571-272-1677. The examiner can normally be reached on Mon-Fri from 8 to 4.30.pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling, can be reached on 571-272-1679. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Savitri Mulpuri
Primary Examiner
Art Unit 2812